

## STATEMENT OF LEGAL AND FACTUAL BASIS

Virginia Electric and Power Company  
Darbytown Combustion Turbine Station  
Darbytown Road and South Laburnum Avenue  
Richmond, Virginia  
Permit No. VA-50997

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Virginia Electric Power has applied for a Title V Operating Permit for its facility. The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact: \_\_\_\_\_

Jennifer Hoeffner  
(804) 527-5123

Date: \_\_\_\_\_

Air Permit Manager: \_\_\_\_\_

James E. Kyle

Date: \_\_\_\_\_

Deputy Director: \_\_\_\_\_

James J. Golden

Date: \_\_\_\_\_

## **FACILITY INFORMATION**

### Permittee

Virginia Electric and Power Company  
5000 Dominion Boulevard  
Glen Allen, VA 23060

### Facility

Darbytown Power Station  
Darbytown Road and South Laburnum Avenue  
Richmond, VA 23231

County Plant ID No. 087-0156

## **SOURCE DESCRIPTION**

SIC Code: 4911

The Virginia Electric Power Darbytown Generating Station is an electric power generation facility. Natural gas is received via gas pipelines to operate up to four General Electric Model PG711-EA simple cycle gas turbines each rated at  $1,308 \times 10^6$  Btu per hour on natural gas. No. 2 Fuel Oil is also available to fire any or all of the turbines, which are rated at  $1,250 \times 10^6$  Btu per hour for No. 2 distillate oil.

The turbines were originally installed in 1989 and all turbines are subject to the requirements of 40 CFR 60, Subpart GG. The facility is a Title V major source of SO<sub>2</sub> and NO<sub>x</sub> pollutants. This source is located in an attainment area for all pollutants, and is a minor source under PSD regulations. The area is a VOC control area with an EPA approved maintenance plan. The facility was originally permitted under an NSPS Permit issued on September 7, 1989. The facility was modified as reflected in a permit issued on May 1, 2000, to add inlet air cooling. This permit was amended on January 10, 2003, to clarify ambiguous terms relating to the operation of the inlet air cooling system. This permit was amended on **DRAFT** to further clarify periodic monitoring of the turbines.

## **COMPLIANCE STATUS**

The facility is inspected at least once per year. The facility is in compliance with the State Air Pollution Control Board regulations.

## **EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION**

The emission units are grouped as follows:

Fuel Burning Equipment

All fuel burning equipment with capacity to emit above the insignificant source level. Details in the table below. All significant emission sources are in this category.

## Emission Units

Equipment to be operated consists of:

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity *	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
<b>Fuel Burning Equipment</b>							
ES-1a	EP-1	General Electric PG7111-EA Turbine Unit 1 firing gas	1308 MMBTU/hr	water injection	CD-1	NOx	1/10/03
ES-1b	EP-1	General Electric PG7111-EA Turbine Unit 1 firing oil	1250 MMBTU/hr	water injection	CD-1	NOx	1/10/03
ES-2a	EP-2	General Electric PG7111-EA Turbine Unit 2 firing gas	1308 MMBTU/hr	water injection	CD-2	NOx	1/10/03
ES-2b	EP-2	General Electric PG7111-EA Turbine Unit 2 firing oil	1250 MMBTU/hr	water injection	CD-2	NOx	1/10/03
ES-3a	EP-3	General Electric PG7111-EA Turbine Unit 3 firing gas	1308 MMBTU/hr	water injection	CD-3	NOx	1/10/03
ES-3b	EP-3	General Electric PG7111-EA Turbine Unit 3 firing oil	1250 MMBTU/hr	water injection	CD-3	NOx	1/10/03
ES-4a	EP-4	General Electric PG7111-EA Turbine Unit 4 firing gas	1308 MMBTU/hr	water injection	CD-4	NOx	1/10/03
ES-4b	EP-4	General Electric PG7111-EA Turbine Unit 4 firing oil	1250 MMBTU/hr	water injection	CD-4	NOx	1/10/03

\*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement, rating cited on a nominal basis.

## **EMISSIONS INVENTORY**

The emissions from the 2001 calendar year are summarized below:

Total CO Emissions: 8.91 tons

Total NO<sub>x</sub> Emissions: 55.84 tons

Total SO<sub>2</sub> Emissions: 12.44 tons

Total PM-10 Emissions: 2.40 tons

Total VOC Emissions: 0.88 tons

No Significant HAP Emissions

**EMISSION UNIT APPLICABLE REQUIREMENTS****New Source Review Permit Requirements**

The majority of conditions contained in the federal operating permit are requirements necessary to comply with the conditions of the New Source Review permit for the facility issued July 27, 2001. A Copy of the permit is attached as Appendix B. The conditions of the federal operating permit and the corresponding conditions of the NSR permit are displayed in the table below:

Title V Condition	NSR Condition	Description	VAC Applicable Requirement
III-A-1	3	Water injectors for NO <sub>x</sub> control	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-2	4	Low sulfur fuels for SO <sub>2</sub> control	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-3	5	Fuels acceptable for particulate control	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-4	6	Combustion practices to minimize CO and VOC	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-5	7	Interlocks to insure inlet air controls are not activated inappropriately (increase CO)	9 VAC 5-80-110, 9 VAC 5-50-260, 9 VAC 5-50-20
III-A-6	13	Power level set-point for air conditioning (below set-point CO/NO <sub>x</sub> ratio inverts)	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-80-1180)
III-A-7	14	Fuel limitation	9 VAC 5-80-110, (9 VAC 5-80-1100)
III-A-8	16	Natural gas sulfur limit	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-80-1100)
III-A-9	17	Fuel oil sulfur limit	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-170-160)
III-A-10	15	Fuel consumption limit	9 VAC 5-80-110, (9 VAC 5-80-1100)
III-A-11	18	Emission limit – short term using gas	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-12	19	Emission limit – short term using oil	9 VAC 5-80-110, 9 VAC 5-50-260
III-A-13	20	Definition of terms specific to facility	9 VAC 5-80-110, (9 VAC 5-170-160)
III-A-14	22	Visible emission limit	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260
III-A-15	23	Requirement by reference to NSPS Subpart GG	9 VAC 5-80-110, 9 VAC 5-50-400, 9 VAC 5-50-410, CFR 60-GG
III-B-1	8*	Monitor for fuel/water mix *original test notification requirement removed	9 VAC 5-80-110, 9 VAC 5-50-20, 9 VAC 5-50-260
III-B-2	9	Natural gas sulfur content monitoring requirement	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
III-B-3	10	Natural gas nitrogen content monitoring waiver	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
III-B-4	11	Fuel oil sulfur and nitrogen content monitoring requirements	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
III-B-5	33	Operation and maintenance procedures	9 VAC 5-80-110, 9 VAC 5-50-20
III-C-1	27	Methodology for record keeping calculations	9 VAC 5-80-110, (9 VAC 5-170-160)
III-C-2	28	Record Keeping Requirements	9 VAC 5-80-110, 9 VAC 5-50-50
III-D-1	12	Provide test ports at appropriate locations on request	9 VAC 5-80-110, 9 VAC 5-50-30
III-D-2	25	Periodic and on request testing for NO <sub>x</sub>	9 VAC 5-80-110, 9 VAC 5-50-30
III-D-3	25	On request testing for SO <sub>2</sub> , CO, PM, VOC	9 VAC 5-80-110, 9 VAC 5-50-30
Title V Condition	NSR Condition	Description	VAC Applicable Requirement
III-D-4	26	V E's on request for specific units	9 VAC 5-80-110, 9 VAC 5-50-30

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IV-A-1	21	Plantwide emission limits	9 VAC 5-80-110, 9 VAC 5-50-260
IV-A-2	24	Requirement by reference to NSPS Subpart Kb	9 VAC 5-80-110, 9 VAC 5-50-400, 9 VAC 5-50-410, CFR 60-Kb
IV-A-3	32	Violation of ambient air standard	9 VAC 5-80-110, 9 VAC 5-20-180
IV-C-1,2&3	28	Record Keeping Requirements	9 VAC 5-80-110, 9 VAC 5-50-50
IV-D-1	12	Provide test ports at appropriate locations on request	9 VAC 5-80-110, 9 VAC 5-50-30
IV-E-1	29	Requirement for quarterly excess emissions reports	9 VAC 5-80-110, 9 VAC 5-50-50

References in parentheses ( ) refer to regulation that have not been incorporated into a revised State Implementation Plan. Most of these are identical to SIP approved regulations with a now deleted section number in the revised Virginia Code.

### **Proper Equipment Operation**

It is the practice of the Virginia Department of Environmental Quality to require in emission permits conditions that the emission sources, such as fuel burning equipment, be operated in a proper manner. Such conditions were omitted from the Darbytown permit as being extraneous since only fuel burning equipment and associated tankage is permitted. Proper operation was assumed from the operating requirements of the permit. A proper operation condition is being included in the Title V permit to further justify that record keeping and emission estimates based on fuel usage, fuel analysis, and fuel/water mixture monitoring will be sufficient to demonstrate compliance with emission limits for combustion products. Since no continuous emission monitors for NO<sub>x</sub> or SO<sub>2</sub> were required and other parametric monitoring was deemed adequate, the proper operation stipulation has been added to the federal operating permit for completeness.

Condition III-A-17 is a general condition for proper operation of the combustion turbines.

Condition III-B-5 requires procedures and documentation to support proper operation and is duplicated in the NSR permit.

Taken together with the fuel limits and fuel analysis conditions, these conditions should be sufficient to establish compliance without continuous emission monitors for NO<sub>x</sub> and SO<sub>2</sub>.

### **Standard Testing Methods**

It is the practice of the agency to reference the appropriate USEPA test methods for testing done in addition to monitoring explicitly specified in federal operating permits. Conditions III-D-5 and IV-D-2 summarize the appropriate test methods.

**Periodic Monitoring**

The permit content requirements of the regulations for federal operating permits, 9 VAC 5-80-110, state that the permit should include conditions for periodic monitoring sufficient to demonstrate that the facility is in compliance with the limits of the permit. The record keeping requirements, fuel requirements, monitoring requirements and proper operation requirements discussed above are deemed sufficient to determine compliance with the emission limits for combustion gasses. Little or no opacity is expected under normal operation of the equipment on the primary fuel.

Condition III-D-2 adds a requirement of once per permit period in addition to “at the request of VDEQ” for testing of nitrogen oxides to demonstrate compliance with permit limits, since the facility is a Title V major source of this pollutant. Since Method 20 stipulates no sulfur dioxide testing for facilities practicing fuel sulfur limitation, no periodic requirement was added for sulfur dioxide testing although it is a Title V major source pollutant. Also, the facility would need to operate on fuel oil for a significant portion of a year to reach major source SO<sub>2</sub> levels and this is not considered likely.

Condition IV-B-1 requires that if any of the simple cycle combustion turbines (ES-1, ES-2, ES-3, and ES-4) are operated for a total of more than 20 cumulative hours during a calendar year, the permittee will demonstrate compliance with the opacity limits by conducting visible emissions observations (VEO's) on each simple cycle combustion turbine exhaust (ES-1, ES-2, ES-3, and ES-4). The frequency of these checks shall be:

- at least one VEO per calendar year.
- at least one VEO every 200 hours of boiler operation.
- at least one VEO during any operability verification testing conducted on the boiler. Operability verification testing refers to any periodic tests conducted by the source to assure that the boilers could be put into operation if needed.

Each VEO shall be performed for a sufficient period of time to identify the presence of visible emissions. If visible emissions are observed, a Method 9 certified observer shall conduct a VEO. If visible emissions do not appear to exceed 10% opacity, no action shall be required. However, if the observed visible emissions appear to exceed 10% opacity, a 6-minute Method 9 visible emission evaluation (VEE) shall be conducted. If the average opacity exceeds 20%, modifications and/or repairs shall be performed to correct the problem and the corrective measures shall be recorded. If the opacity problem persists, an 18-minute VEE shall be performed to determine compliance with the 20% opacity limit.

Condition IV-C-4 requires that records of the periodic monitoring results be maintained.

**NOx SIP Call**

A requirement by reference condition was originally added to the Title V permit and used to address this applicable requirement. This permit modification adds the exact regulatory requirements of the NOx Budget Trading Program (9 VAC 5 Chapter 140).

**GENERAL CONDITIONS**



The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

## INSIGNIFICANT EMISSION UNITS

The following emission units at the facility are identified in the application as insignificant emission units under 9 VAC 5-80-720:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
IS-1*	Two No. 2 Fuel Oil Storage Tanks	9 VAC 5-80-720B	VOC	3,125,000 gallons each
IS-2	Three Oil/Water Separators	9 VAC 5-80-720B	VOC	350 to 2000 gallons
IS-3	Natural Gas Heaters	9 VAC 5-80-720C	PM, CO, VOC, SO <sub>2</sub> , NO <sub>x</sub>	6.87 MMBTU/hr total
IS-4	Turbine Glycol Cooling Systems (4)	9 VAC 5-80-720B	VOC, HAP	Less than 1000 gallons total
IS-5	Turbine Lube Oil Systems (4)	9 VAC 5-80-720B	VOC	Less than 15,000 gallons total

These insignificant emission units are presumed to be in compliance with all requirements of the federal Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping, or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

- \*Record keeping is required for this unit only, see condition IV-A-2.

## STREAMLINED REQUIREMENTS

Gas fired particulate limit under 9 VAC 5-40-900: 0.1695 lb/MMBTU = 222 lb/hr  
Gas fired particulate limit under this permit: 6.3 lb/hr

Oil fired particulate limit under 9 VAC 5-40-900: 0.1715 lb/MMBTU = 214 lb/hr  
Oil fired particulate limit under this permit: 66 lb/hr

Gas fired sulfur dioxide limit under 9 VAC 5-40-930: 3,453 lb/hr  
Gas fired sulfur dioxide limit under this permit: 12.5 lb/hr

Oil fired sulfur dioxide limit under 9 VAC 5-40-930: 3,300 lb/hr  
Oil fired sulfur dioxide limit under this permit: 253 lb/hr

## CONFIDENTIAL INFORMATION

No information contained in the permit application or in the specific records required by the permit is considered confidential.

## PUBLIC PARTICIPATION

The original public notice regarding the draft permit was in the April 15, 2003, edition of the *Richmond Times-Dispatch*. Public comments were accepted from April 15, 2003, through May 14, 2003. **The minor modification issued on December 1, 2003 did not require a public comment period. EPA was given 45-days to review the proposed amended permit and no comments were received.**

## APPENDIX A: NSR/FOP CORRESPONDENCE TABLE

The following table is a modification of the table in the section Emission Unit Applicable Requirements – New Source Review Permit Requirements. This table is ordered corresponding to the NSR permit conditions as an aid to reference the corresponding federal operating permit conditions. The NSR permit follows in Appendix B.

NSR Condition	Title V Condition	Description	VAC Applicable Requirement
3	III-A-1	Water injectors for NO <sub>x</sub> control	9 VAC 5-80-110, 9 VAC 5-50-260
4	III-A-2	Low sulfur fuels for SO <sub>2</sub> control	9 VAC 5-80-110, 9 VAC 5-50-260
5	III-A-3	Fuels acceptable for particulate control	9 VAC 5-80-110, 9 VAC 5-50-260
6	III-A-4	Combustion practices to minimize CO and VOC	9 VAC 5-80-110, 9 VAC 5-50-260
7	III-A-5	Interlocks to insure inlet air controls are not activated inappropriately (increase CO)	9 VAC 5-80-110, 9 VAC 5-50-260, 9 VAC 5-50-20
8*	III-B-1	Monitor for fuel/water mix *original test notification requirement removed	9 VAC 5-80-110, 9 VAC 5-50-20, 9 VAC 5-50-260
9	III-B-2	Natural gas sulfur content monitoring requirement	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
10	III-B-3	Natural gas nitrogen content monitoring waiver	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
11	III-B-4	Fuel oil sulfur and nitrogen content monitoring requirements	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260, NSPS GG
12	III-D-1, IV-D-1	Provide test ports at appropriate locations on request	9 VAC 5-80-110, 9 VAC 5-50-30
13	III-A-6	Power level set-point for air conditioning (below set-point CO/NO <sub>x</sub> ratio inverts)	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-80-1180)
14	III-A-7	Fuel limitation	9 VAC 5-80-110, (9 VAC 5-80-1100)
15	III-A-10	Fuel consumption limit	9 VAC 5-80-110, (9 VAC 5-80-1100)
16	III-A-8	Natural gas sulfur limit	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-80-1100)
17	III-A-9	Fuel oil sulfur limit	9 VAC 5-80-110, 9 VAC 5-50-260, (9 VAC 5-170-160)
18	III-A-11	Emission limit – short term using gas	9 VAC 5-80-110, 9 VAC 5-50-260
19	III-A-12	Emission limit – short term using oil	9 VAC 5-80-110, 9 VAC 5-50-260
20	III-A-13	Definition of terms specific to facility	9 VAC 5-80-110, (9 VAC 5-170-160)
21	IV-A-1	Plantwide emission limits	9 VAC 5-80-110, 9 VAC 5-50-260
22	III-A-14	Visible emission limit	9 VAC 5-80-110, 9 VAC 5-50-80, 9 VAC 5-50-260
23	III-A-15	Requirement by reference to NSPS Subpart GG	9 VAC 5-80-110, 9 VAC 5-50-400, 9 VAC 5-50-410, CFR 60-GG
24	V-A-2	Requirement by reference to NSPS Subpart Kb	9 VAC 5-80-110, 9 VAC 5-50-400, 9 VAC 5-50-410, CFR 60-Kb
25	III-D-2, III-D-3	On request testing for NO <sub>x</sub> , SO <sub>2</sub> , CO, PM, & VOC	9 VAC 5-80-110, 9 VAC 5-50-30
26	III-D-4, IV-B-1	V E's on request for specific units	9 VAC 5-80-110, 9 VAC 5-50-30
27	III-C-1	Methodology for record keeping calculations	9 VAC 5-80-110, (9 VAC 5-170-160)
28	III-C-2, IV-C-1, 2 & 3	Record Keeping Requirements	9 VAC 5-80-110, 9 VAC 5-50-50
29	IV-E-1	Requirement for quarterly excess emissions reports	9 VAC 5-80-110, 9 VAC 5-50-50
NSR Condition	Title V Condition	Description	VAC Applicable Requirement
30	VII-R	Inspection and entry requirements	9 VAC 5-80-110

31	VII-F	Failure/malfunction reporting	9 VAC 5-20-180, 9 VAC 5-80-250
32	IV-A-3	Violation of ambient air standard	9 VAC 5-80-110, 9 VAC 5-20-180
33	III-B-5	Operation and maintenance procedures	9 VAC 5-80-110, 9 VAC 5-50-20
34	VII-V	Permit revocation or termination	9 VAC 5-80-260
35	VII-U	Transfer of permits	9 VAC 5-80-160
36	VII-O	Duty to submit information	9 VAC 5-80-110
37	VII-T	Permit availability	9 VAC 5-50-150

References in parentheses ( ) refer to regulation that have not been incorporated into a revised State Implementation Plan. Most of these are identical to SIP approved regulations with a now deleted section number in the revised Virginia Code.

**APPENDIX B: NSR PERMIT DATED January 10, 2003**

The permit, with its own page numbering, follows.

Filename: 50997 Title V SOB.doc  
Directory: I:\maharvey\airweb\air\pubnotice\drafts  
Template: D:\Office 97\Templates\Normal.dot  
Title: STATEMENT OF LEGAL AND FACTUAL BASIS  
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